

ACCESSION #: 9104190352

LICENSEE EVENT REPORT (LER)

FACILITY NAME: R. E. Ginna Nuclear Power Plant

PAGE: 1 OF 06

DOCKET NUMBER: 05000244

TITLE: Inadvertent Closure of "A" Steam Generator Main Feedwater
Regulating Valve Due to Controller Malfunction, Causes a Reactor
Trip On Low Steam Generator Water Level

EVENT DATE: 06/09/90 LER #: 90-010-01 REPORT DATE: 04/09/91

OTHER FACILITIES INVOLVED:

DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 097

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Wesley H. Backus
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Operations Manager

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COMPONENT FAILURE DESCRIPTION:

CAUSE: B SYSTEM: JB COMPONENT: LC MANUFACTURER: F180
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On June 9, 1990, at 0411 EDST with the Reactor at approximately 97% full power, a reactor trip occurred from "A" Steam Generator (S/G) Low Level coincident with "A" S/G Steam Flow/Feed Flow mismatch.

The two reactor trip breakers opened as required and all shutdown and control rods inserted as designed.

The reactor trip was due to a malfunctioning "A" S/G Main Feedwater Regulating Valve Control System.

The underlying cause of the malfunctioning "A" S/G Feedwater Regulating Valve Control System was a faulty Feedwater Flow Controller. The failure of the controller was localized to a 4 Stage AC Amplifier section.

Immediate Corrective Action was to stabilize the plant in hot shutdown.

Subsequent action was to change out the existing controller with a spare.

END OF ABSTRACT

TEXT

PAGE 2 OF 6

I. PRE-EVENT PLANT CONDITIONS

The unit was at approximately 97% steady state full power with no major activities in progress.

II. DESCRIPTION OF EVENT

A. DATES AND APPROXIMATE TIMES OF MAJOR OCCURRENCES:

- o June 9, 1990, 0411 EDST: Event date and time.
- o June 9, 1990, 0411 EDST: Event discovery date and time.
- o June 9, 1990, 0411 EDST: Control Room operators verify both reactor trip breakers open and all control and shutdown rods inserted.
- o June 9, 1990, 0421 EDST: Closed both Main Steam Isolation Valves (MSIVs) to terminate plant cool down.
- o June 9, 1990, 0431 EDST: Plant stabilized at hot shutdown.

B. EVENT:

On June 9, 1990, at 0411 EDST, with the reactor at approximately 97% full power, a reactor trip occurred. This trip was due to low level in the "A" Steam Generator (i.e. steam generator level \leq 30%) coincident % with steam flow - feed flow mismatch, (i.e. steam flow \geq 0.8E6 lbm/hr more than feedwater flow).

The Control Room operators performed the applicable actions of Emergency Operating Procedures, E-0 (Reactor Trip or Safety Injection) and ES-0.1, (Reactor Trip Response) and stabilized the plant.

TEXT

PAGE 3 OF 6

Both reactor trip breakers opened as required and all control and shutdown rods were verified inserted.

Subsequently, the Main Steam Isolation Valves (MSIVs) were closed to terminate a plant cool down. it is believed this cool down was partially due to cooler water being fed to the steam generators and partially due to a delay in closure of the condenser steam dump valves after the trip.

The Control Room operators notified higher supervision and the Nuclear Regulatory Commission (NRC) of the reactor protection system activation from the "A" Steam Generator (S/G) Low Level coincident with Steam Flow - Feedwater Flow (SF/FF) mismatch.

C. INOPERABLE STRUCTURES, COMPONENTS, OR SYSTEMS THAT CONTRIBUTED TO THE EVENT:

None

D. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

None

E. METHOD OF DISCOVERY:

The event was immediately apparent due to alarms and indications in the Control Room.

F. OPERATOR ACTION:

After the reactor trip, the Control Room operators performed the actions of Emergency Operating Procedures E-0, (Reactor

Trip or Safety Injection) and ES-0.1, (Reactor Trip Response) and stabilized the plant. The MSIVs were closed subsequent to the trip to terminate a plant cool down.

TEXT

PAGE 4 OF 6

G. SAFETY SYSTEM RESPONSE:

None

III. CAUSE OF EVENT

A. IMMEDIATE CAUSE:

The reactor trip occurred due to "A" S/G Low Level $\leq 30\%$, coincident with "A" S/G SF/FF mismatch $\geq 0.8E6$ lbm/hr.

B. INTERMEDIATE CAUSES:

The "A" S/G Low Level coincident with "A" S/G SF/FF mismatch was due to the "A" S/G Main Feedwater Regulating Valve inadvertently closing.

The "A" S/G Main Feedwater Regulating Valve inadvertently closing was due to its Foxboro Model 62H Controller (i.e. FC-466A) malfunctioning. FC-466A current output failed low. Failure low of the output current immediately causes the feedwater valve to close.

C. ROOT CAUSE:

The underlying cause of FC-466A output current failing low was the degradation of the first stage transistor in FC-466A's 4 Stage AC Amplifier. This failure was due to the change in the transistor's gain characteristics.

IV. ANALYSIS OF EVENT

This event is reportable in accordance with 10 CFR 50.73, Licensee Event Report System, item (a)(2)(iv), which requires reporting of "any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS)," in that the "A" S/G Low Level coincident with "A" S/G SF/FF mismatch reactor trip was an automatic actuation of the RPS.

TEXT

PAGE 5 OF 6

An assessment was performed considering both the safety consequences and implications of this event with the following results and conclusions:

- o The two reactor trip breakers opened as required.
- o All control and shutdown rods inserted as designed.
- o The plant was stabilized in hot shutdown.

This transient was compared to the Loss of Normal Feedwater Flow Transient described in the Ginna Updated Final Safety Analysis Report (UFSAR). None of the assumptions of the UFSAR were violated during this event.

The response of the plant to this transient is bounded by the results of the UFSAR analysis. The analysis of this transient showed that the plant responded as expected to the loss of feedwater to the "A" S/G.

During the entire event, the "A" and "B" S/Gs were always available as a heat sink due to sufficient auxiliary feedwater flow to both S/Gs and adequate steam release from both S/Gs.

Based on the above, it can be concluded that the public's health and safety was assured at all times.

V. CORRECTIVE ACTION

A. ACTION TAKEN TO RETURN AFFECTED SYSTEMS TO PRE-EVENT NORMAL STATUS:

The instrument and Control (I&C) Shop removed the existing "A" S/G Feedwater Controller, installed the spare feedwater controller in the "A" S/G Main Feedwater Control System, and calibrated and tested it satisfactorily.

TEXT

PAGE 6 OF 6

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

FCC-466A was tagged on January 25, 1991 to be discarded after the 1991 outage when the Advanced Digital Feedwater Control System is installed.

VI. ADDITIONAL INFORMATION

A. FAILED COMPONENTS:

The failed component was the "A" S/G Main Feedwater Regulating Valve Controller FC-466A. This controller was manufactured by Foxboro Company. The controller's model number is 62H-4E and Serial Number is 2208968.

B. PREVIOUS LERs ON SIMILAR EVENTS:

A similar LER event historical search was conducted with the following results: No other documentation of similar LER events with the same root cause at Ginna Station could be identified. However, LERs 85-006, 85-019, 88-003, 88-005, and 90-007 were similar events with different root causes.

C. SPECIAL COMMENTS:

None.

ATTACHMENT 1 TO 9104190352

PAGE 1 OF 1

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U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Subject: LER 90-010 (Revision 1), Inadvertent Closure of "A"
Steam Generator Main Feedwater Regulating Valve Due
to Controller Malfunction Causes a Reactor Trip On
Low Steam Generator Water Level
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

In accordance with 10 CFR 50.73, Licensee Event Report System, item (a)(2)(iv), which requires a report of, "any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF) including the Reactor Protection System (RPS)", the attached Licensee Event Report LER 90-010 (Revision 1) is hereby submitted. This revision is necessary to revise Section III (Cause of Event) due to the root cause being identified.

Very truly yours,

Robert C. Mecredy

xc: U. S. Nuclear Regulatory Commission
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Ginna USNRC Senior Resident Inspector

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